

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant : Simon C. Steely, Jr., et al.
Serial No. : 10/760,659
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For : SYSTEM AND METHOD FOR NON-MIGRATORY
REQUESTS IN A CACHE COHERENCY
PROTOCOL
Group Art Unit : 2188
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REPLY BRIEF

Sir:

This Reply Brief is in response to the Examiner's Answer dated February 8, 2008. This Reply Brief addresses the Examiner's Answer concerning the appealed claims 1, 8-12 and 18-32.

I. Preliminary Comments

Before responding to any specific arguments, the Examiner's Answer dated February 8, 2008 ("Examiner's Answer") stated the following in response to arguments based on obviousness under 35 U.S.C. §103(a) with respect to U.S. Patent Application Pub. No. 2002/0129211 to Arimilli et al. ("Arimilli") in view of U.S. Patent No. 6,931,496 to Chen et al. ("Chen") and in further view of U.S. Patent No. 6,484,240 to Cypher et al. ("Cypher"):

Appellant, in his arguments for the most part, appears to ignore the combined teachings of the cited references but simply argues the references individually in an attempt to show nonobviousness. (Examiner's Answer, Page 12).

Appellant's representative respectfully submits that in the Appeal Brief filed November, 30, 2007 ("Appeal Brief"), that arguments were presented in a way that was commensurate with the specific issues presented in the Final Office Action issued on April 20, 2007 ("Final Action"). Appellant's representative respectfully submits that in the Final Action, it was argued (multiple times) that support for a first set of features are found in a first reference (e.g., Arimilli) and that support for a second set of features are found in a second reference (e.g., Chen; See e.g., Final Action, Pages 11-12). Thus, Appellant's representative simply responded to the arguments offered in the Final Rejection, which, in contrast to the contentions made in the Examiner's Answer, were not based on the combined teachings of the references.

As noted in the Appeal Brief, to reject claims in an application under section 103 of Title 35, an Examiner must show an un rebutted *prima facie* case of obviousness. See *In re Deuel*, 51 F.3d 1552, 1557, 34 U.S.P.Q.2d 1210, 1214 (Fed. Cir. 1995). In the absence of a proper *prima facie* case of obviousness, an Appellant who complies with the other statutory requirements is entitled to a patent. See *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992). Appellant's representative submits that the Appeal Brief clearly establishes that no such *prima facie* case of obviousness was established for the claims, primarily because the Final Action relies on erroneous conclusions of what is taught or suggested by Arimilli and Chen.

II. Appealed Claims 1 and 28

In the Examiner's Answer, it is contended that the claim 1 recites functional recitations that do not make claim 1 patentably distinct from the prior art of record. In particular, the Examiner's Answer states the following (and reiterates the concept multiple times):

Examiner would like to point out the functional recitations of 'the second node is [capable of or] operative to receive data from the first node and that the second node is [capable of or] operative to assign a shared state do not make the claimed invention patentably distinct over the prior art of record. While features of a system may be recited either structurally or functionally, claims directed to a system must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 U.S.P.Q.2d 1428, 1431-32 (Fed. Cir. 1997) (The absence of a disclosure in a prior art reference relating to function did not defeat the Boards finding of anticipation of a claimed apparatus because the limitations at issue were found to be inherent in the prior art reference)... (See Examiner's Answer Pages 13-14, see also, pages 21-22 and 25).

Appellant's representative respectfully submits that the above statement demonstrates that the Examiner has not established a *prima facie* case of obviousness with respect to claims 1 and 28. In the case noted in the Examiner's Answer (*In re Schreiber*) the court held that the claimed apparatus was anticipated because the Appellant could not show that the prior art structure did not inherently possess the functionally defined limitations of the claimed apparatus. *In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997). That is, in *Schreiber*, the central issue decided was not the patentable weight of the functional limitations of the claimed apparatus, but whether the prior art of record inherently possessed the features claimed.

First, a limitation is inherently disclosed by a reference only if it is necessarily present and a person of ordinary skill in the art would recognize its presence. *Crown Operations Int'l Ltd.v. Solutia Inc.*, 289 F.3d 1367, 1377, 62 U.S.P.Q.2d 1917, 1922-1923 (Fed. Cir. 2002). Inherency may not be established by probabilities or possibilities. 289 F.3d at 1377, 62 U.S.P.Q. at 1923. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. *Id.* The Examiner's Answer fails to explain (or even contend) that the functional features of

claim 1 are inherently possessed by any of the cited art. Instead, it appears that the Examiner's Answer attempts to dismiss the patentable weight of functional features in view of an erroneous interpretation of the holding of *Schreiber*. Appellant's representative submits that functional terminology covers any and all embodiments which perform the recited function. *In re Swinehart*, 439 F.2d 210, 213, 169 U.S.P.Q. 226 (C.C.P.A. 1971). Appellant's representative asserts that the Final Action and the Examiner's Answer fail to cite any prior art that performs the functional features recited in claim 1. Appellant further mentions that this Board has stated that the Examiner has the "responsibility of evaluating and considering functional limitations in the same manner as any other limitation of the claim." *Ex parte RICHARD F. BAILEY, et al.*, 2001 Pat. App. LEXIS 90 (Pat. App. 2001), citing MPEP § 2173.05(g).

It should be noted that the Examiner's Answer is the first time that the argument is made that functional features of claim 1 do not distinguish claim 1 from the prior art, since claim 1 is a system claim. However, the Final Action relies solely on the rationale of the rejection of claim 1 to support the rejection of claim 28 (See Final Action, Page 14 and Examiner's Answer, Page 6). Claim 28 is a method claim, in contrast to claim 1, which is a system claim. Appellant's representative respectfully submits that if it is the position of the Examiner's Answer that functional features of claim 1 are not afforded patentable weight because claim 1 is a system claim, the actions claimed in the method of claim 28 should have been considered independently. Clearly, this inconsistent logic proffered in the Examiner's Answer fails to establish a *prima facie* case of obviousness with respect to claims 1 and 28.

Further still, even if the Examiner's Answer did show that the functional features of claim 1 were inherently possessed by either Arimilli or Chen (which it does not), Appellant's representative respectfully submits that a *prima facie* case of obviousness has still not been established. Arguments based on "inherent" properties can not stand when there is no supporting teaching in the prior art since inherency and obviousness are distinct concepts. *In re Dillon* 919 F.2d 688, 919 F.2d 688, 718, 16 U.S.P.Q.2d 1897 (Fed. Cir. 1990). Claim 1 has been rejected on an obviousness rejection, not an anticipation rejection. Appellant's representative respectfully submits that the holding in *Dillon* renders the arguments that any prior art inherently possesses the functional features of claim 1 irrelevant. Thus,

Appellant's representative respectfully submits that in the erroneous interpretations of the law offered in the Examiner's Answer cannot support a *prima facie* case of obviousness.

Moreover, the Examiner's Answer repeatedly asserts that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 U.S.P.Q. 871 (C.C.P.A. 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). (See e.g., Examiner's Answer, Pages, 13, 15, 16 and 22). However, the Examiner's Answer fails to show how the combination of Arimilli and Chen is employed to establish a *prima facie* case of obviousness. Instead, the Examiner's Answer simply asserts that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references, and immediately argues that specific teachings of Arimilli and Chen correspond to specific features of the claims. Therefore, Appellant's representative asserts that the Final Action and the Examiner's Answer do not even attempt to base the obviousness rejection on a combination of references, but rather attempts to show obviousness with individual pieces of the references.

In the Appeal Brief, Appellant's representative argued that the claimed element a second node, as recited in claim 1, is not taught or suggested by Arimilli in view Chen when claim 1 is considered as a whole (See Appeal Brief, Pages 17-22). In response, the following was stated in the Examiner's Answer:

Arimilli clearly discloses 'master 26 of a first agent, for example, processor complex 10a (i.e., first node), issues modifying transaction 150a on system bus 12 that targets a cache line that is indicated as shared in the cache directory 22 of at least one agent 10 (i.e., second node); a result of a store request by the processor 16 in the second agent 10 that targets a cache line marked as shared in the second agent's cache processor 22; par. [0029] (Examiner's Answer, Page 13).

Chen can also be relied on for such teaching as shown in the following 'at least a first and a second node; the first node includes an external cache for storing a data from a local memory of the second node and at least two processors optionally accessing the data from the external cache; whether the second certain one of at least two processors is allowed to share the modified data is determined; if the second certain processor is allowed to shared the

modified data, it may be directly request the modified data from the first certain processor; Abstract (Examiner's Answer, Page 13).

Appellant's representative respectfully submits that the statements made in the Examiner's Answer illustrates that claim 1 has not been considered as a whole. In claim 1, the second node is operative to receive data from a first node and assign a shared state to an associated state of the data at the second node, wherein the first node includes the data in a modified state. That is, in claim 1, the second node can assign a shared state to data that has been received from the first node, which is in a modified state. The cited sections of Arimilli and Chen do not even mention assignment of any state to data in a cache, especially not the states and relationships to data being transferred.

In another section, the Examiner's Answer attempts to argue that Chen discloses a node operative to transition from a modified state to an owner state in response to a non-migratory source broadcast request, as recited in claim 1 (and claim 28) (See Examiner's Answer, Page 22). In particular, the Examiner's Answer contends that FIGS. 2-5 of Chen disclose these features of claim 1. The Examiner's Answer contends that it is readily apparent that state transitions result from data requests and response of another node (See Examiner's Answer, Page 22 citing FIG. 5 of Chen). However, the cited FIGS. of Chen make no illustration or mention whatsoever of a node operative to transition from a modified state to an owner state in response to a non-migratory source broadcast request, as contended by the Examiner's Answer.

FIG. 5 of Chen merely states that data in a cache line is modified and the cache line changes from a 1st status to a 2nd status. FIG. 5 of Chen provides no indication of what the 1st status or the 2nd status would indicate. The corresponding description of FIG. 5 does not provide any additional information, but instead only restates the text of the flowchart illustrated in FIG. 5 (See Chen, Par. Col. 9, Lines 14-29). Accordingly, Appellant's representative contends that the Examiner's Answer has failed to show that Arimilli taken in view of Chen (or any evidence of record) makes claims 1 and 28 obvious. A thorough review of the record, including the Final Office Action and the Examiner's Answer failed to present a sufficiently articulated reasoning with some rational underpinning to support the legal conclusion

of obviousness as mandated by the Supreme Court. *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 82 U.S.P.Q.2d 1385 (2007).

Additionally, in the Appeal Brief, Appellant's representative respectfully argued that Arimilli taken in view of Chen does not teach or suggest a non-migratory source request for data, as recited in claims 1 and 28 (See Appeal Brief, Pages 21-24). In response, in the Examiner's Answer, an analogy is drawn between sections of the Specification (Pars. [0037]-[0039], with emphasis added to a sentence in Par. [0038]) and various sections of Chen (See Examiner's Answer, Pages 16-20 and 23-24). Appellant's representative respectfully submits that the sections of the Specification cited in the Examiner's Answer clearly illustrate that claims 1 and 28 have been completely misconstrued. Pars. [0037]-[0038] describe a scenario wherein a processor 12 transmits a source broadcast migratory read (XREADM) to all other processors 14 in a system 10 (See Spec. Pars. [0036]-[0038]).

Claims 1 and 28 recite a non-migratory source broadcast request, which is described, for example, in Pars. [0040]-[0041] of the Specification. While Appellant's representative acknowledges that claims are given their broadest reasonable interpretation in light of the Specification (as noted by the Examiner's Answer on Page 23), the particular section of the Specification cited by the Examiner's Answer is not related to the subject matter of claims 1 and 28. Accordingly, Appellant's representative respectfully submits that the arguments submitted in the Examiner's Answer that attempt to show that Chen discloses a non-migratory source request (as recited in claims 1 and 28) are erroneous since the Examiner's Answer clearly relies on a section of the Specification that is not applicable to the subject matter of claims 1 and 28.

Additionally, in claim 1, the first node is operative to provide the data to the second node and to transition the associated state of the data from the modified state to an owner state without updating memory. Nothing in the Final Action nor the Examiner's Answer cites a section of Arimilli or Chen (taken individually or considered as a combination) that teaches or suggests a first node that is operative to provide the data to the second node and to transition the associated state of the data from the modified state to an owner state without updating memory, as recited in claim 1. The only place in the Examiner's Answer that even attempts to show how the prior art illustrates this concept is in the following statement:

Chen clearly discloses, in the manner described in Appellants' disclosure, 'a protocol employing a dirty (D-state) and an owner-shared state (O-state) to enable read migration without updating memory; the inclusion of the D-state and the O-state in the cache coherency protocol allows for migration of data without write-back (Update), when requested from a cache containing data in the M-state,' and as such discloses 'transitioning an associated state of the first processor from a modified state to an owner state without updating memory;' col. 3, ll 55-65; col. ll 5-10, 35-42; col. 4, ll 60 to col. 6 ll 6; col.6, ll 48 to col. 7, ll 2. (Examiner's Answer, Page 13).

The numerous sections of Chen cited were considered in the Appeal Brief (See Appeal Brief, Pages 22-23). However, for the reasons discussed in the Appeal Brief, the numerous sections of Chen cited by the Examiner's Answer are completely silent on a protocol employing a dirty (D-state) and an owner-shared state (O-state) to enable read migration without updating memory, which the Examiner's Answer describes. Similarly, Chen does not contain any teaching that the inclusion of the D-state and the O-state in its cache coherency protocol allows for migration of data without write-back (Update), as also contended by the Examiner's Answer. Thus, Chen does not teach or suggest transitioning an associated state of a first node from a modified state to an owner state without updating memory, as recited in claim 1. In fact, Appellant's representative respectfully submits that the number of sections of Chen cited by the Examiner's Answer without some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness based on Chen clearly illustrates that a *prima facie* case of obviousness of claims 1 and 28 has not been established.

Yet further, in the Appeal Brief, Appellant's representative argued that there is no motivation to combine and modify the teachings of Arimilli and Chen to read on claims 1 and 28 (See Appeal Brief, Pages 25-26). In response, the Examiner's Answer stated the following:

[S]uch assumptions are just mere allegations for there is nothing either in Arimilli or in Chen supporting appellant's position that combining Arimilli and Chen would provide an adverse result. Finally, in determining obviousness under 35 U.S.C. 103 in view of the Supreme Court decision in *KSR International Co. v. Teleflex Inc.*, the Supreme Court states that for purposes of 35 U.S.C. 103, prior art can be either in the field of endeavor or be reasonably pertinent to the particular problem which the Appellant was concerned...

In response to Applicant's argument that 'the transaction required to maintain coherency in a DSM system would adversely affect the principal of operation of a central memory system,' the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 U.S.P.Q. 871 (C.C.P.A. 1981) (Examiner's Answer, Page 26).

Appellant's representative respectfully submits that the Examiner's Answer does not rebut arguments made in the Appeal Brief regarding the motivation to combine and modify the teachings of Arimilli and Chen. Instead, the Examiner's Answer simply makes mere conclusory statements and restatements of legal principles without providing evidence and reasoning to rebut Appellant's representative's position. Additionally, the Examiner's Answer seems to define what art would constitute "analogous art," as well as a general test for obviousness which was not at issue. Thus, Appellant's representative respectfully submits that the Examiner's Answer has failed to rebut the argument that there is not proper motivation to combine and modify the teachings of Arimilli and Chen to read on claims 1 and 28.

For the reasons stated above, as well as the reasons given in the Appeal Brief, Appellant's representative respectfully submits that a *prima facie* case of obviousness of claims 1 and 28 has not been established. Accordingly, Appellant's representative respectfully requests that the rejection of claims 1 and 28 be withdrawn, and that claims 1 and 28 be passed to issue.

III. Appealed Claims 12 and 24

In the Examiner's Answer, the Examiner offers nearly identical arguments to support the rejection of claims 12 and 24 as were used to support the rejection of claim 1 and 28 (See Examiner's Answer, Pages 27-37). Thus, Appellant's representative respectfully submits that the Final Action and the Examiner's Answer fail to establish a *prima facie* case of obviousness with respect to claims 12 and 24 for reasons similar to those discussed above with respect to claims 1 and 28, as well as the reasons discussed in the Appeal Brief.

In particular, the Examiner's Answer fails to show that all of the claimed features of claims 12 and 24 are taught or suggested by Arimilli taken in view of Chen. Additionally, the Examiner's Answer fails to give adequate patentable weight to functional features recited in claims 12 and 24. Further still, the Examiner's Answer fails to show that there is proper motivation to combine and modify the teachings of Arimilli and Chen to read on the systems recited in claims 12 and 24. Thus, Appellant's representative respectfully requests that the rejection of claims 12 and 24 be withdrawn and that the claims 12 and 24 are passed to issue.

CONCLUSION

In view of the foregoing remarks, Appellant's representative respectfully submits that the present application is in condition for allowance. Appellant's representative respectfully requests reconsideration of this application and that the application be passed to issue.

No additional fees should be due for this Reply Brief. In the event any fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to Deposit Account No. 08-2025.

I hereby certify that this correspondence is being transmitted to the U.S. Patent and Trademark Office via electronic filing on March 18, 2008.

Respectfully submitted,

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